FIG.1

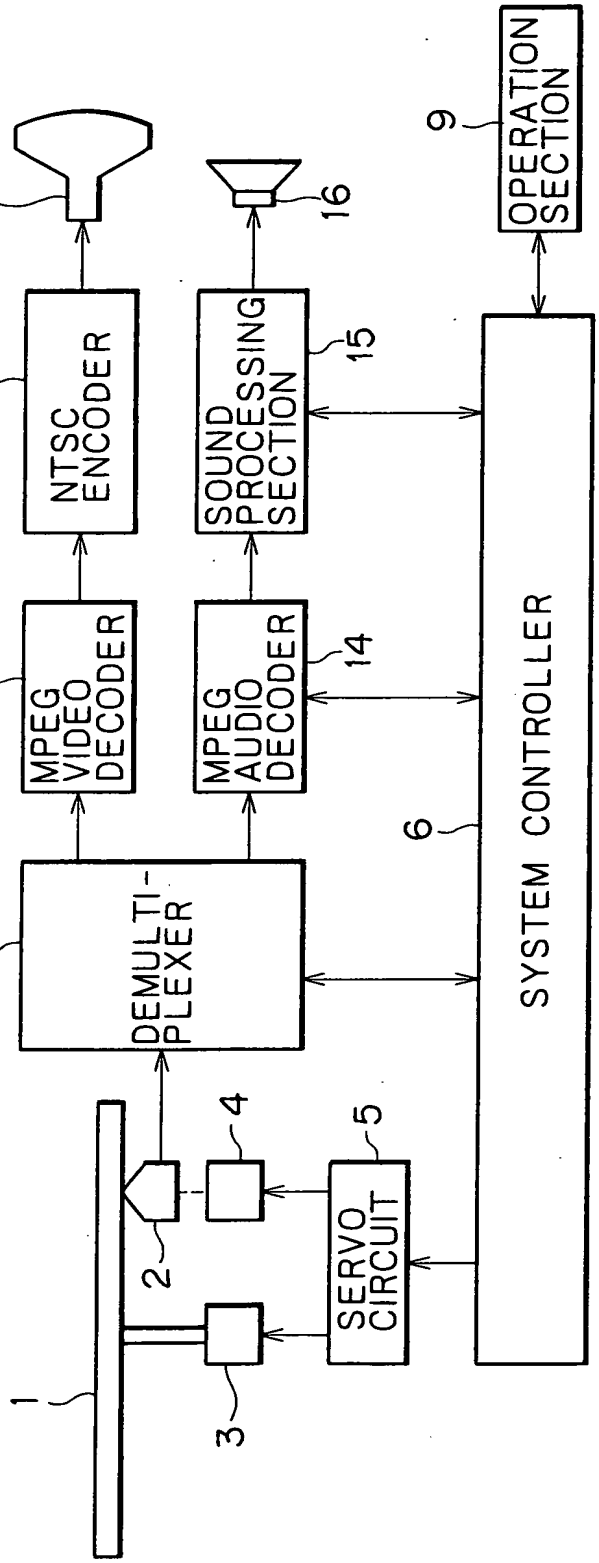

1
2
3
4
5
SERVO CIRCUIT
7
DEMULTI-PLEXER
6
SYSTEM CONTROLLER
9
OPERATION SECTION
11
MPEG VIDEO DECODER
12
NTSC ENCODER
13
14
MPEG AUDIO DECODER
15
SOUND PROCESSING SECTION
16

FIG. 2

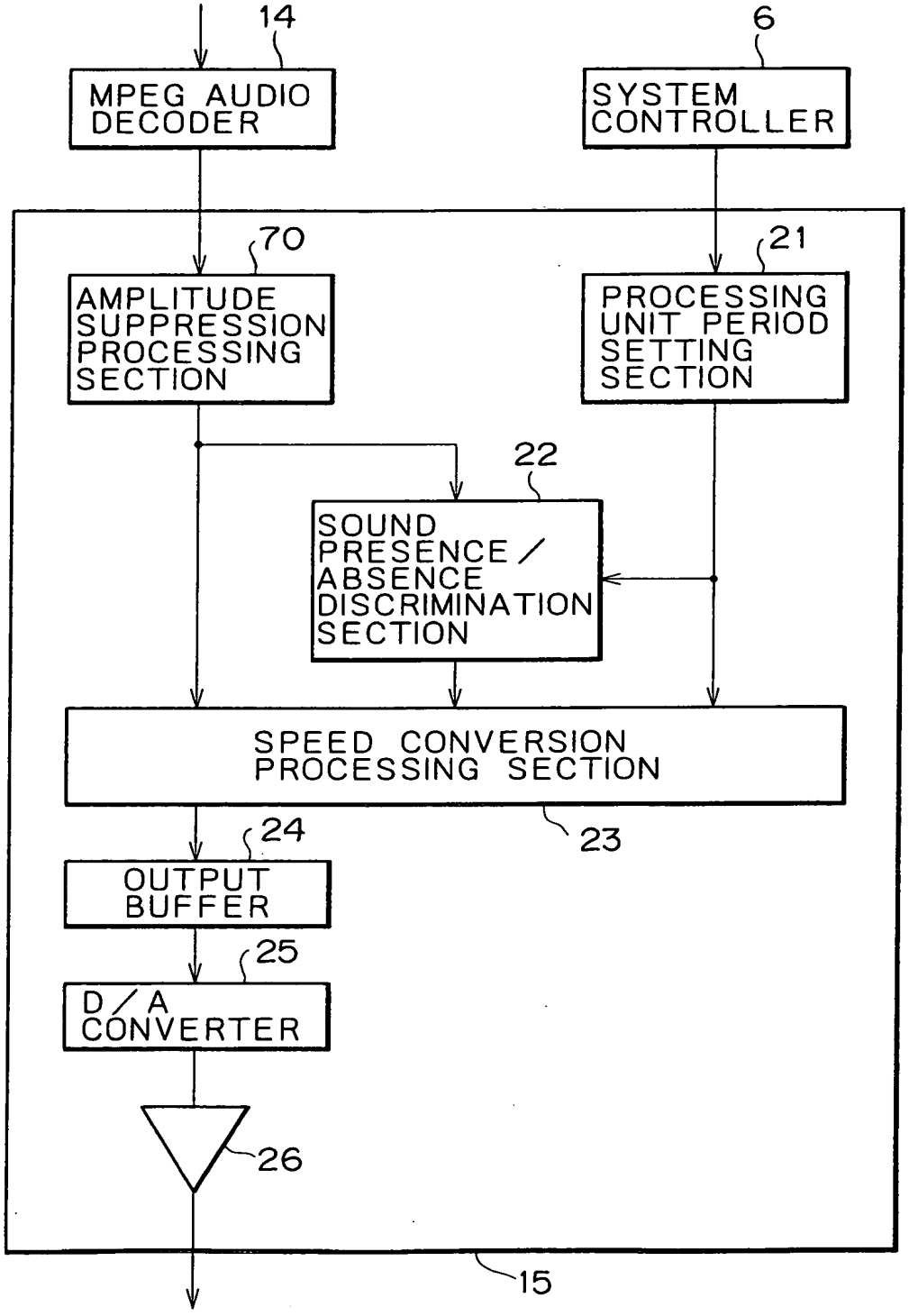
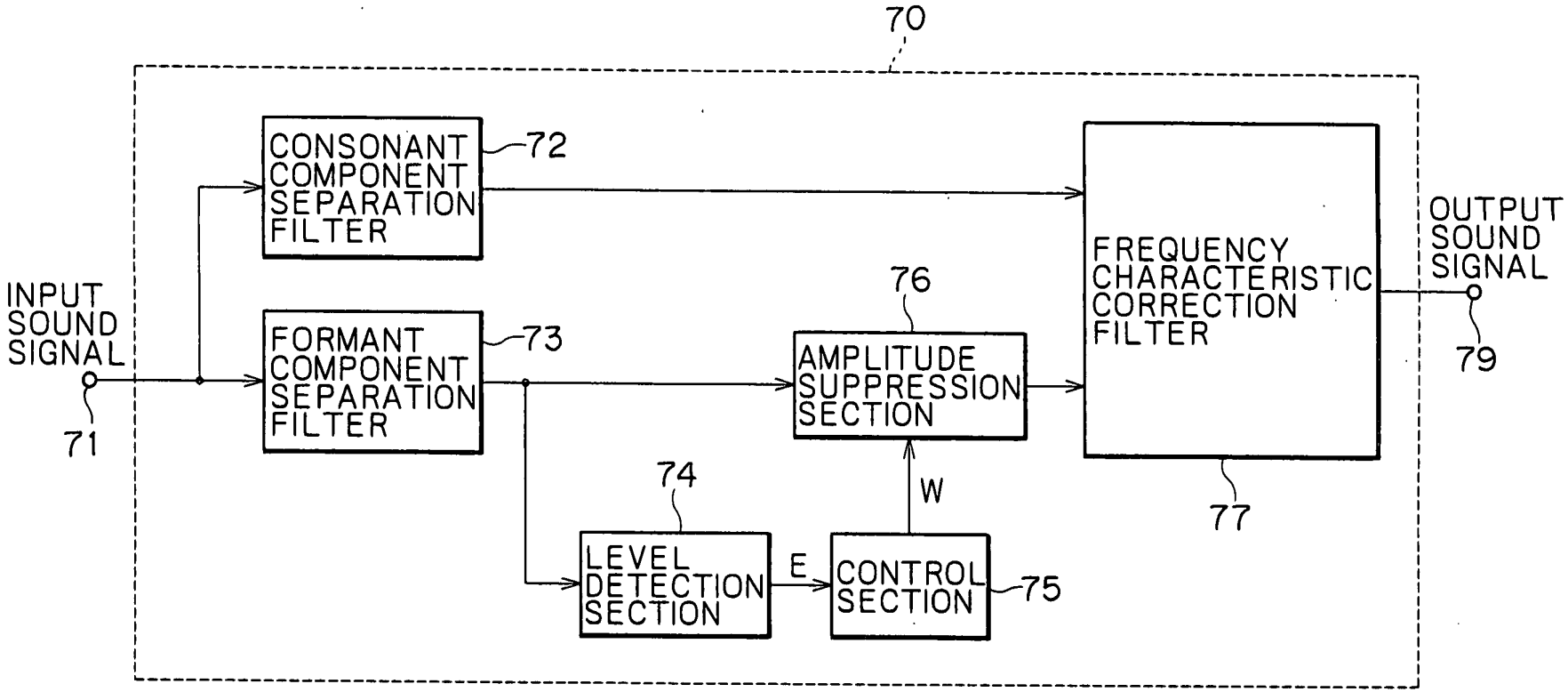

14
MPEG AUDIO DECODER
6
SYSTEM CONTROLLER
70
AMPLITUDE SUPPRESSION PROCESSING SECTION
21
PROCESSING UNIT PERIOD SETTING SECTION
22
SOUND PRESENCE / ABSENCE DISCRIMINATION SECTION
SPEED CONVERSION PROCESSING SECTION
23
24
OUTPUT BUFFER
25
D / A CONVERTER
26
15

FIG. 3


70
CONSONANT COMPONENT SEPARATION FILTER
72
FORMANT COMPONENT SEPARATION FILTER
73
INPUT SOUND SIGNAL
71
76
AMPLITUDE SUPPRESSION SECTION
W
74
LEVEL DETECTION SECTION
E
CONTROL SECTION
75
FREQUENCY CHARACTERISTIC CORRECTION FILTER
77
OUTPUT SOUND SIGNAL
79

0002360 "0024960

FIG. 4A

INPUT SOUND SIGNAL

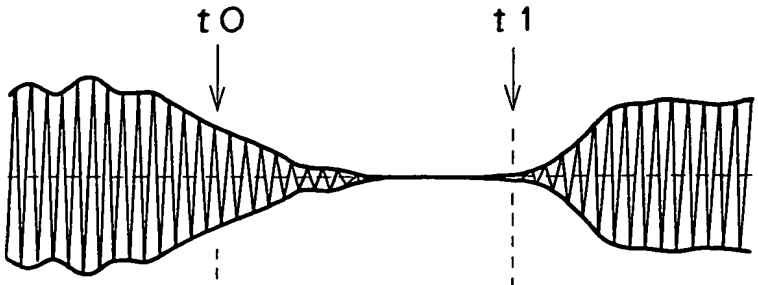


FIG. 4B

LEVEL DETECTION VALUE E

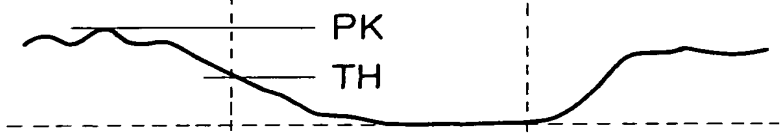


FIG. 4C

CONTROL COEFFICIENT W (GAIN LEVEL)

FIG. 4D

OUTPUT SOUND SIGNAL

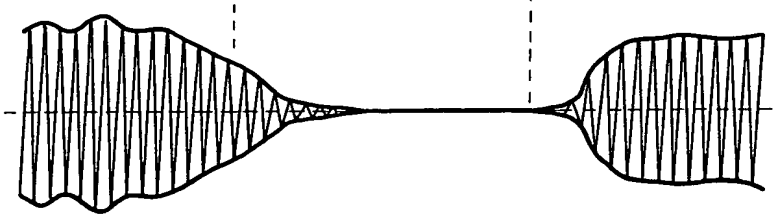


FIG. 5

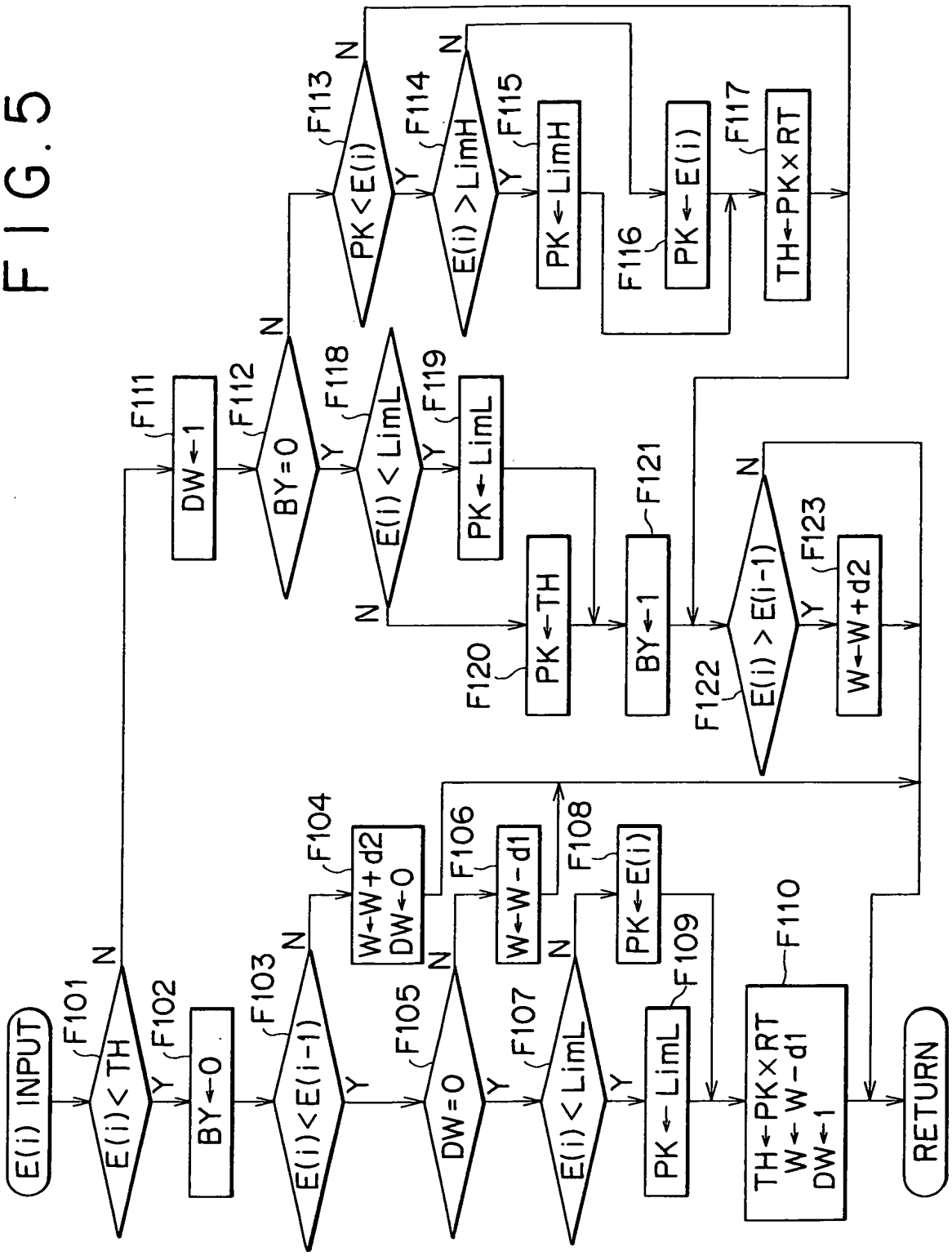

E(i) INPUT
F101
E(i)<TH
N
Y
F102
BY←0
F103
E(i)<E(i-1)
N
Y
F104
W←W+d2
DW←0
F105
DW=0
N
Y
F106
W←W-d1
F107
E(i)<LimL
N
Y
F108
PK←E(i)
F109
PK←LimL
F110
TH←PK×RT
W←W-d1
DW←1
RETURN
F111
DW←1
F112
BY=0
N
Y
F113
PK<E(i)
N
Y
F114
E(i)>LimH
N
Y
F115
PK←LimH
F116
PK←E(i)
F117
TH←PK×RT
F118
E(i)<LimL
N
Y
F119
PK←LimL
F120
PK←TH
F121
BY←1
F122
E(i)>E(i-1)
N
Y
F123
W←W+d2

FIG.6A

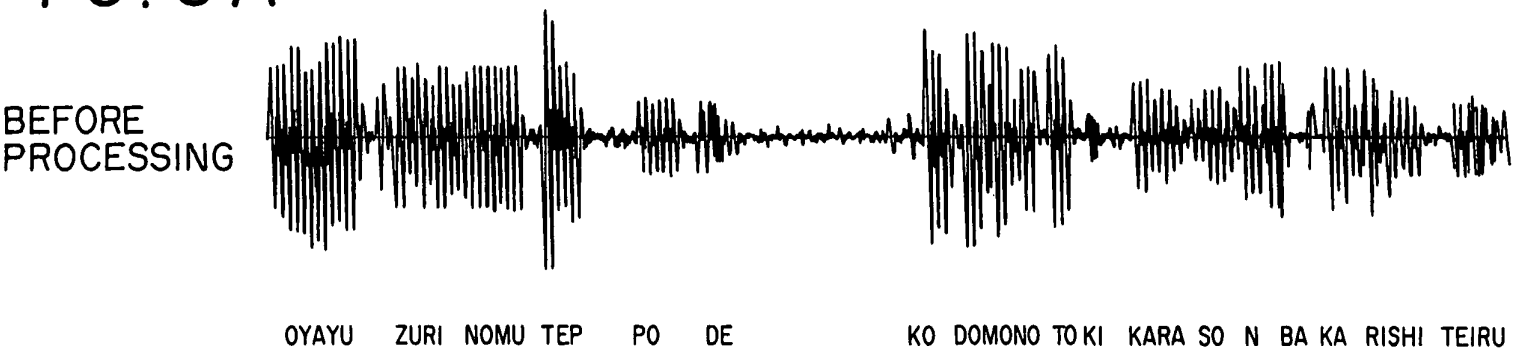

BEFORE PROCESSING
OYAYU ZURI NOMU TEP PO DE
KO DOMONO TO KI KARA SO N BA KA RISHI TEIRU

FIG.6B

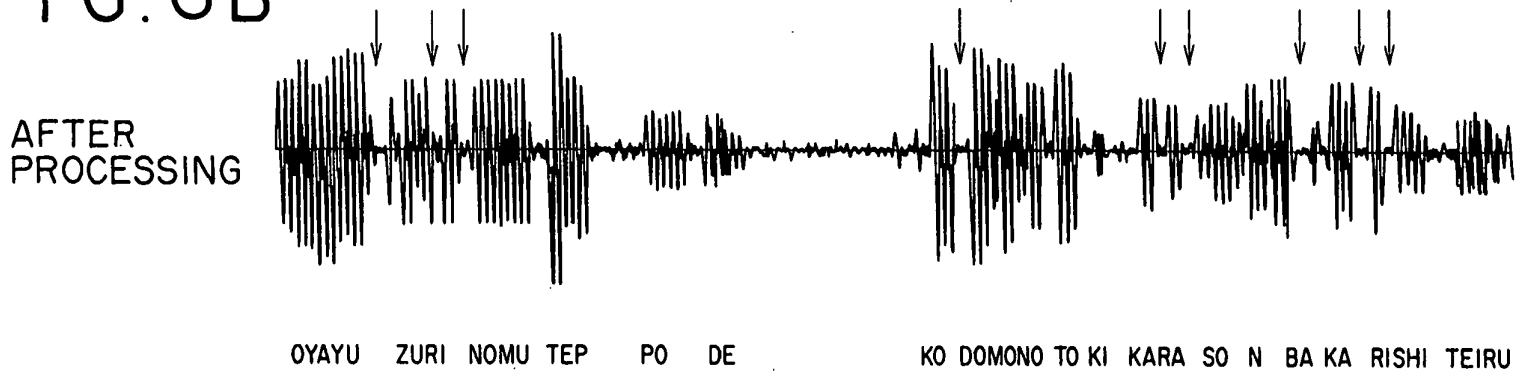

AFTER PROCESSING
OYAYU ZURI NOMU TEP PO DE
KO DOMONO TO KI KARA SO N BA KA RISHI TEIRU

FIG. 7

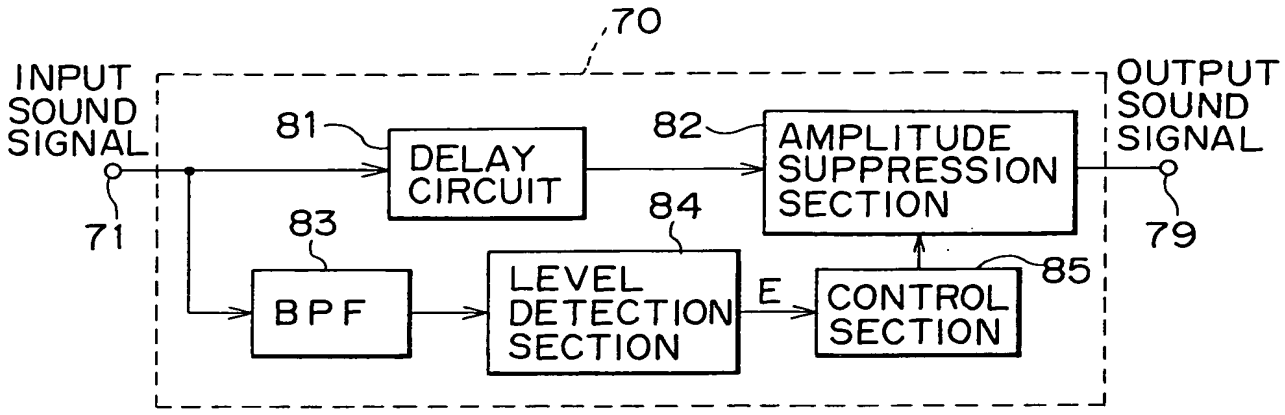


FIG. 8

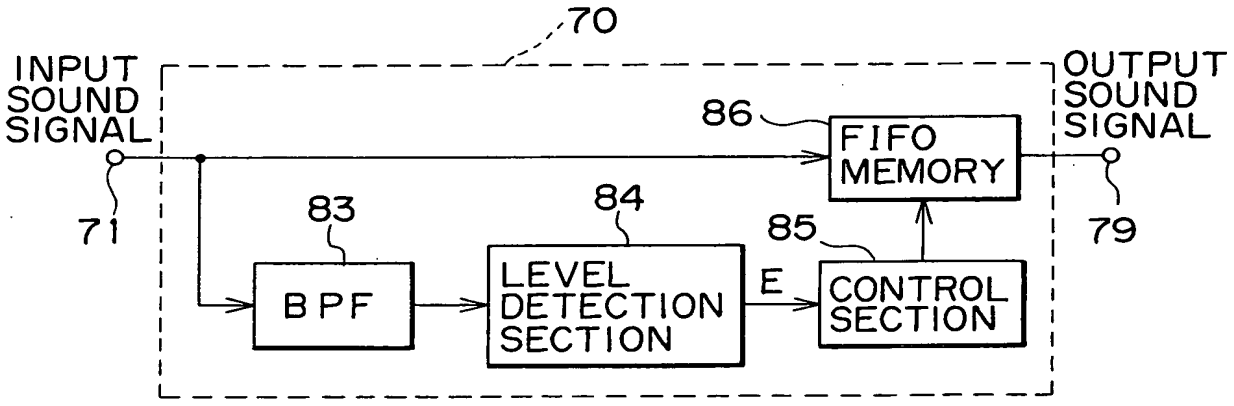


FIG. 9

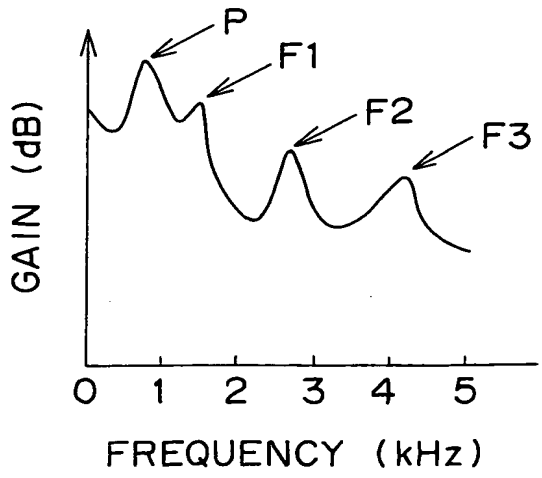


FIG.10

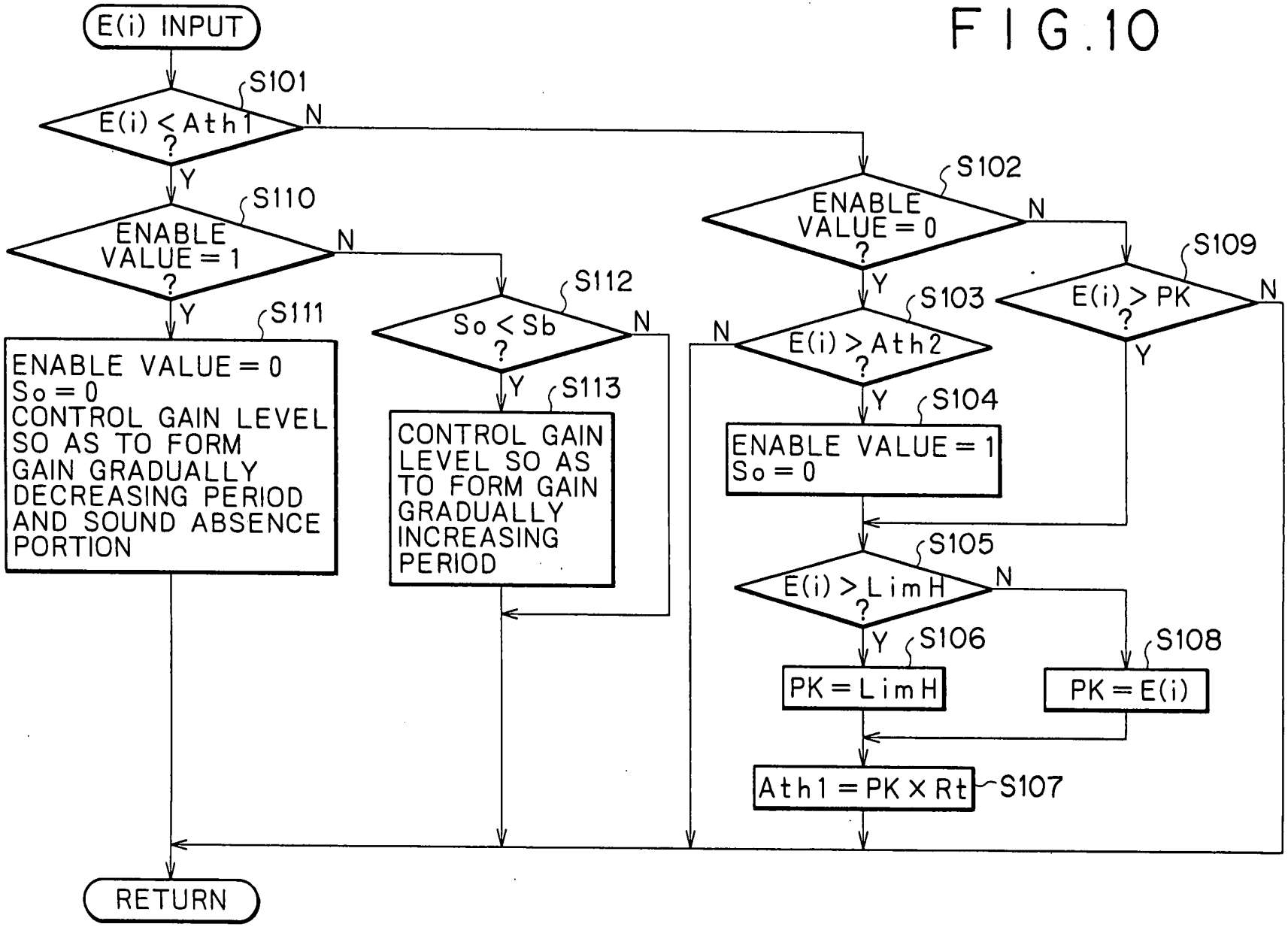

E(i) INPUT
S101
E(i) < Ath1 ?
N
Y
S110
ENABLE VALUE = 1 ?
N
Y
S111
ENABLE VALUE = 0
So = 0
CONTROL GAIN LEVEL SO AS TO FORM GAIN GRADUALLY DECREASING PERIOD AND SOUND ABSENCE PORTION
S112
So < Sb ?
N
Y
S113
CONTROL GAIN LEVEL SO AS TO FORM GAIN GRADUALLY INCREASING PERIOD
S102
ENABLE VALUE = 0 ?
N
Y
S103
E(i) > Ath2 ?
N
Y
S104
ENABLE VALUE = 1
So = 0
S109
E(i) > PK ?
N
Y
S105
E(i) > LimH ?
N
Y
S106
PK = LimH
S108
PK = E(i)
Ath1 = PK x Rt
S107
RETURN

FIG.11

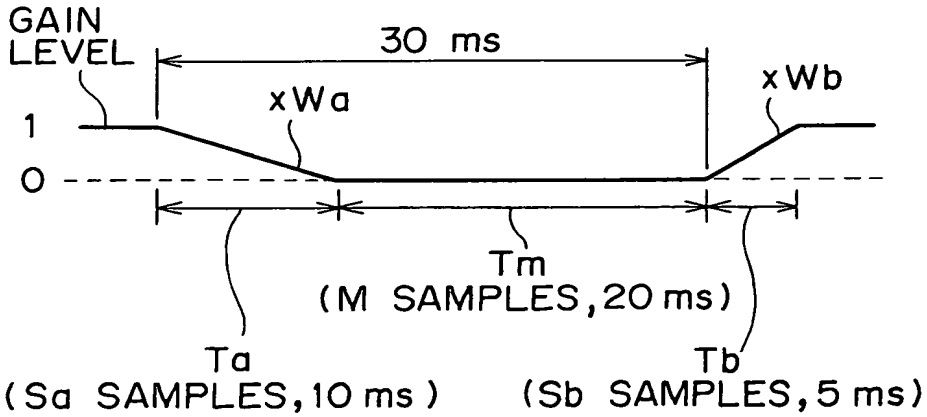


FIG.12A

INPUT SOUND SIGNAL

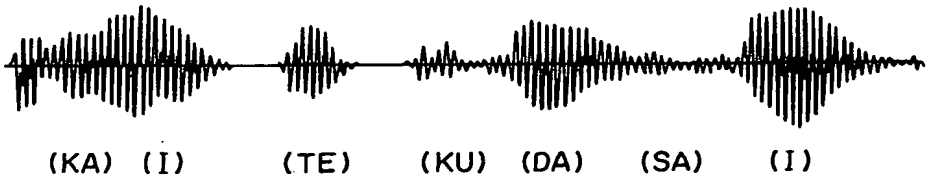


FIG.12B

OUTPUT SOUND SIGNAL

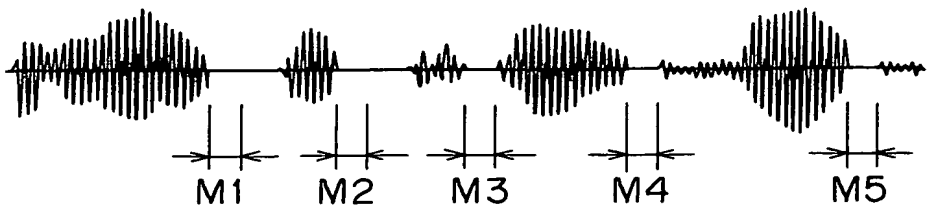
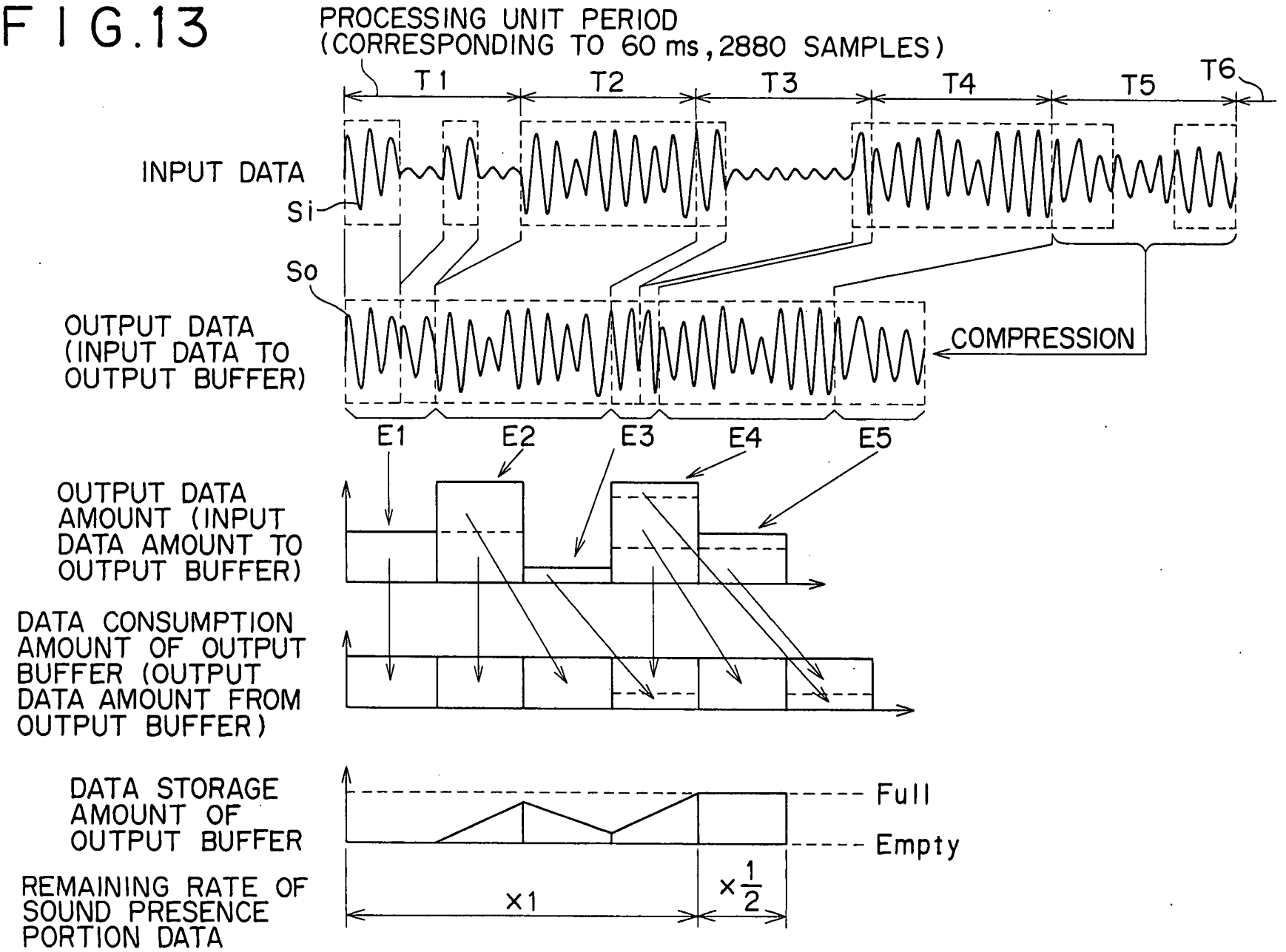


FIG.13


PROCESSING UNIT PERIOD
(CORRESPONDING TO 60 ms, 2880 SAMPLES)
T1
T2
T3
T4
T5
T6
INPUT DATA
Si
So
OUTPUT DATA
(INPUT DATA TO
OUTPUT BUFFER)
COMPRESSION
E1
E2
E3
E4
E5
OUTPUT DATA
AMOUNT (INPUT
DATA AMOUNT TO
OUTPUT BUFFER)
DATA CONSUMPTION
AMOUNT OF OUTPUT
BUFFER (OUTPUT
DATA AMOUNT FROM
OUTPUT BUFFER)
DATA STORAGE
AMOUNT OF
OUTPUT BUFFER
Full
Empty
REMAINING RATE OF
SOUND PRESENCE
PORTION DATA
x1
x 1/2

0022600 0022750

FIG.14

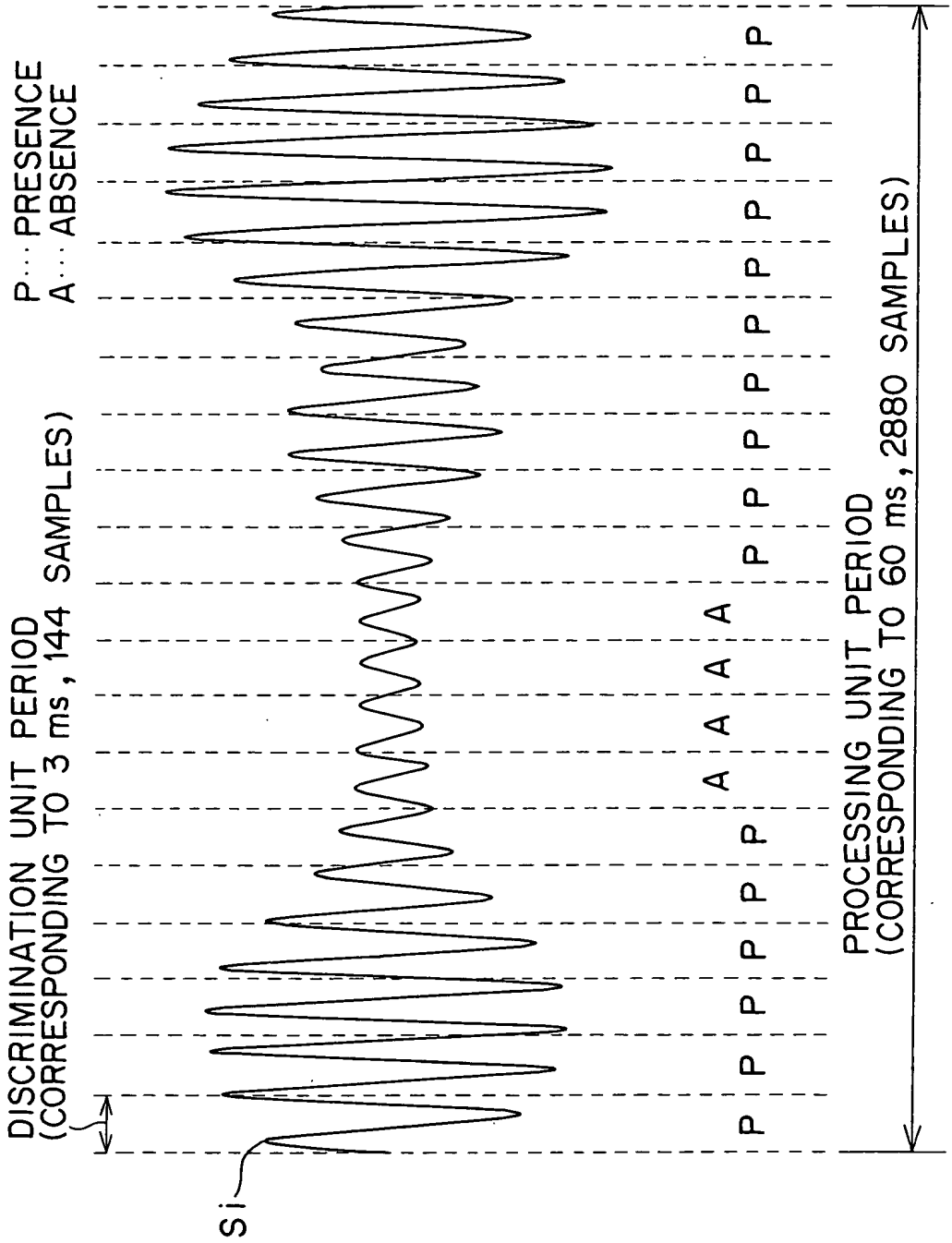


FIG.15A FIG.15B FIG.15C

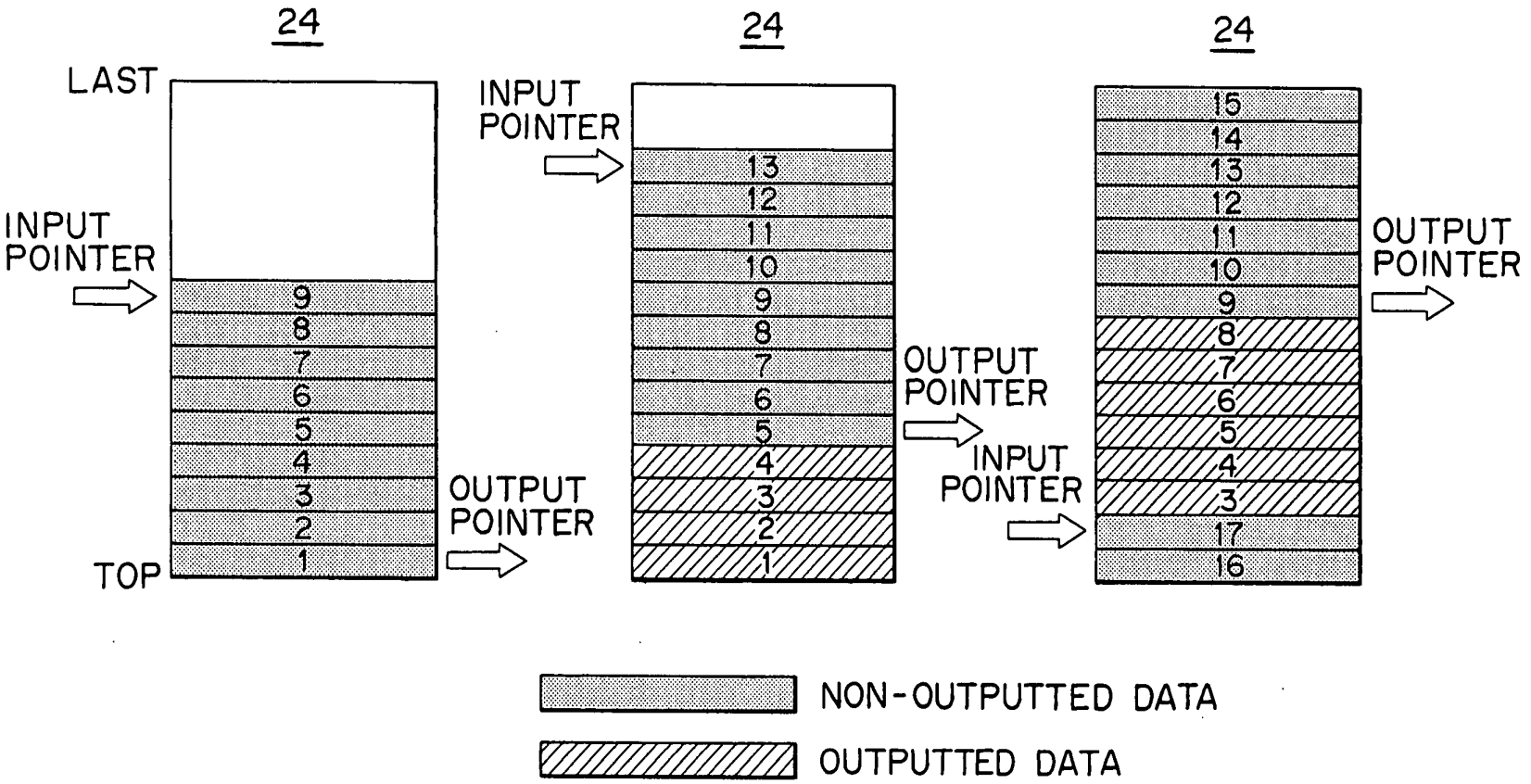


FIG. 16

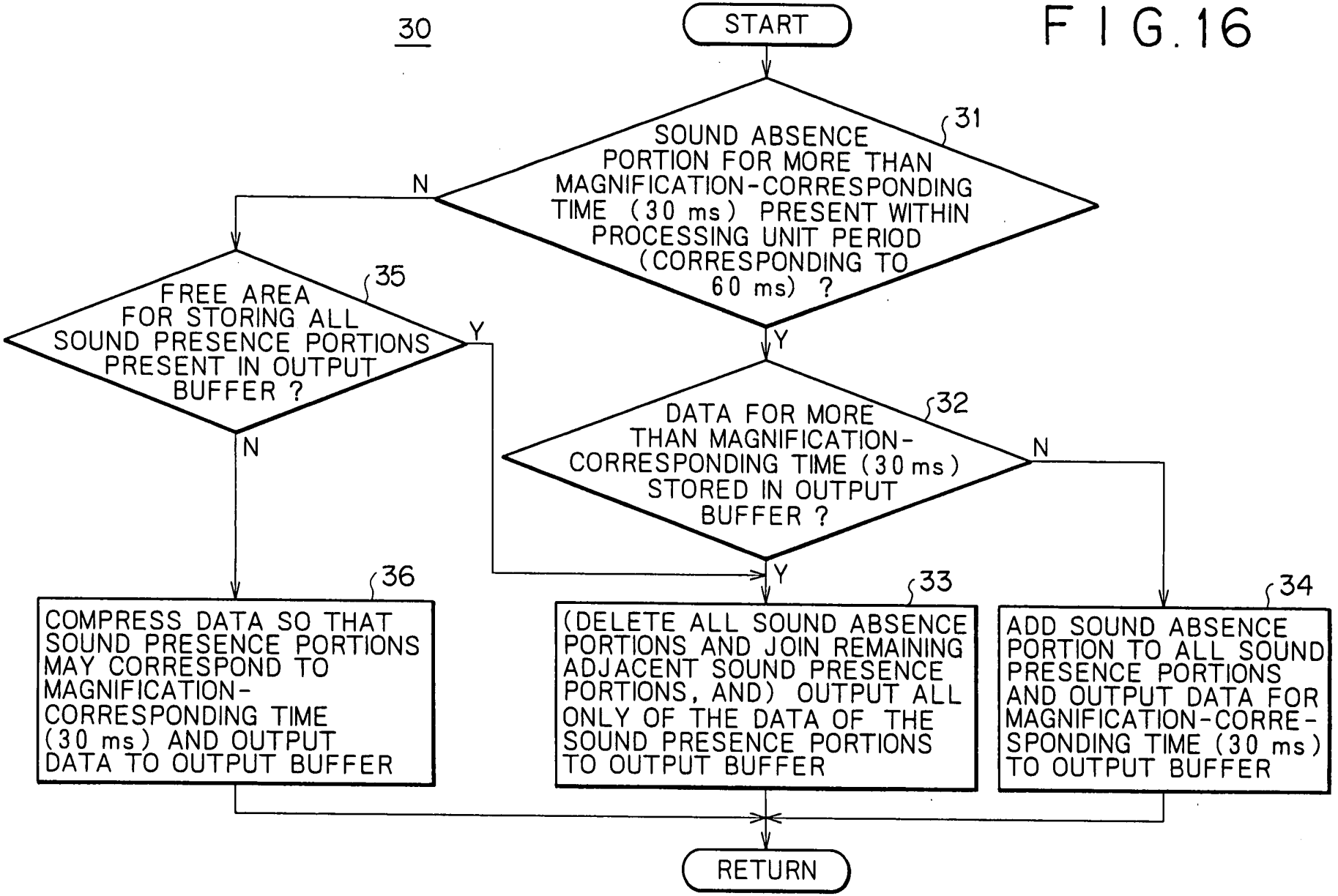

30
START
31
SOUND ABSENCE PORTION FOR MORE THAN MAGNIFICATION-CORRESPONDING TIME (30 ms) PRESENT WITHIN PROCESSING UNIT PERIOD (CORRESPONDING TO 60 ms) ?
N
Y
35
FREE AREA FOR STORING ALL SOUND PRESENCE PORTIONS PRESENT IN OUTPUT BUFFER ?
Y
N
32
DATA FOR MORE THAN MAGNIFICATION-CORRESPONDING TIME (30 ms) STORED IN OUTPUT BUFFER ?
N
Y
36
COMPRESS DATA SO THAT SOUND PRESENCE PORTIONS MAY CORRESPOND TO MAGNIFICATION-CORRESPONDING TIME (30 ms) AND OUTPUT DATA TO OUTPUT BUFFER
33
(DELETE ALL SOUND ABSENCE PORTIONS AND JOIN REMAINING ADJACENT SOUND PRESENCE PORTIONS, AND) OUTPUT ALL ONLY OF THE DATA OF THE SOUND PRESENCE PORTIONS TO OUTPUT BUFFER
34
ADD SOUND ABSENCE PORTION TO ALL SOUND PRESENCE PORTIONS AND OUTPUT DATA FOR MAGNIFICATION-CORRESPONDING TIME (30 ms) TO OUTPUT BUFFER
RETURN

FIG.17

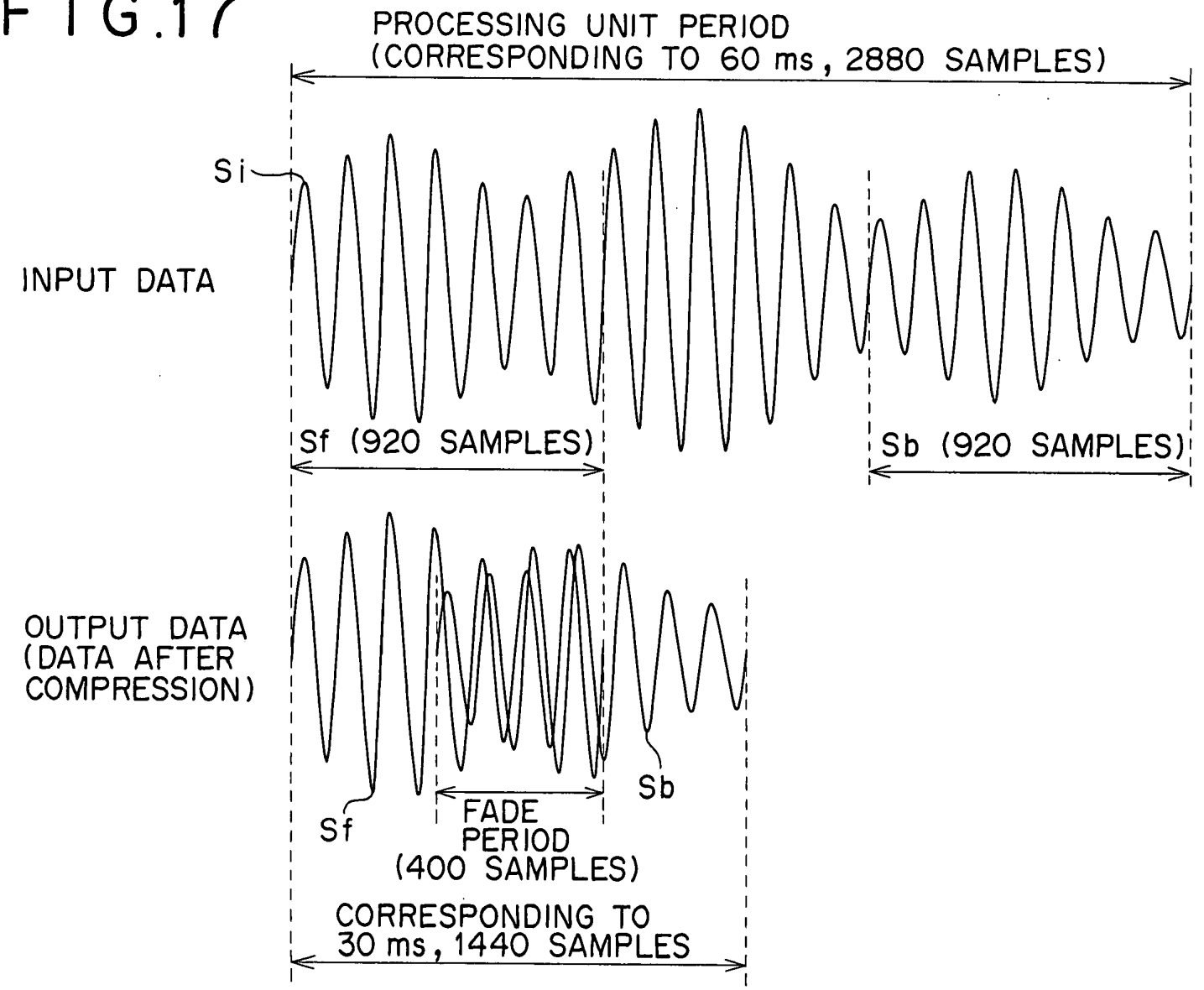

PROCESSING UNIT PERIOD
(CORRESPONDING TO 60 ms, 2880 SAMPLES)
Si
INPUT DATA
Sf (920 SAMPLES)
Sb (920 SAMPLES)
OUTPUT DATA
(DATA AFTER
COMPRESSION)
Sf
FADE
PERIOD
(400 SAMPLES)
Sb
CORRESPONDING TO
30 ms, 1440 SAMPLES

FIG.18A

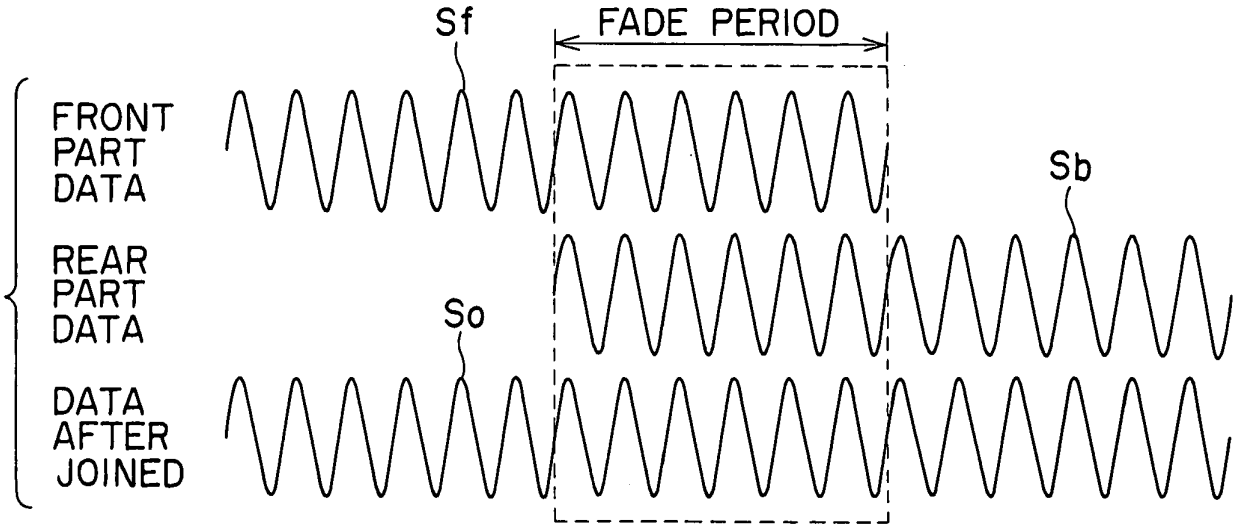


FIG.18B

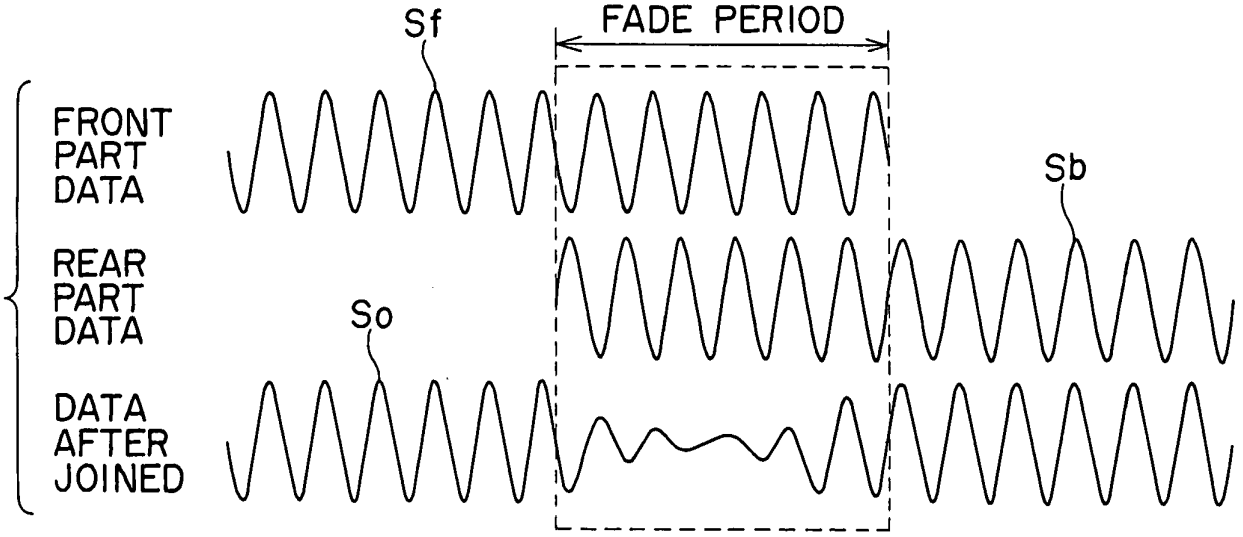


FIG.19

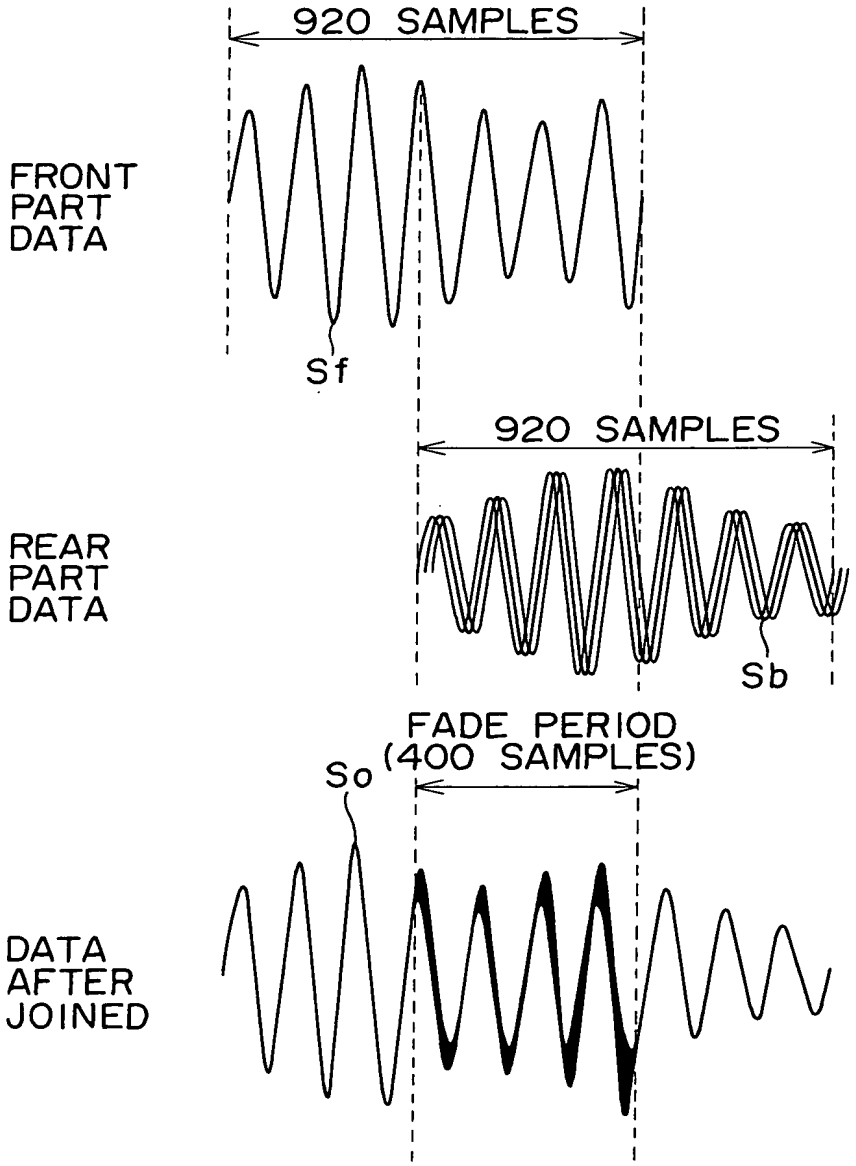

920 SAMPLES
FRONT PART DATA
Sf
920 SAMPLES
REAR PART DATA
Sb
FADE PERIOD (400 SAMPLES)
So
DATA AFTER JOINED

FIG.20

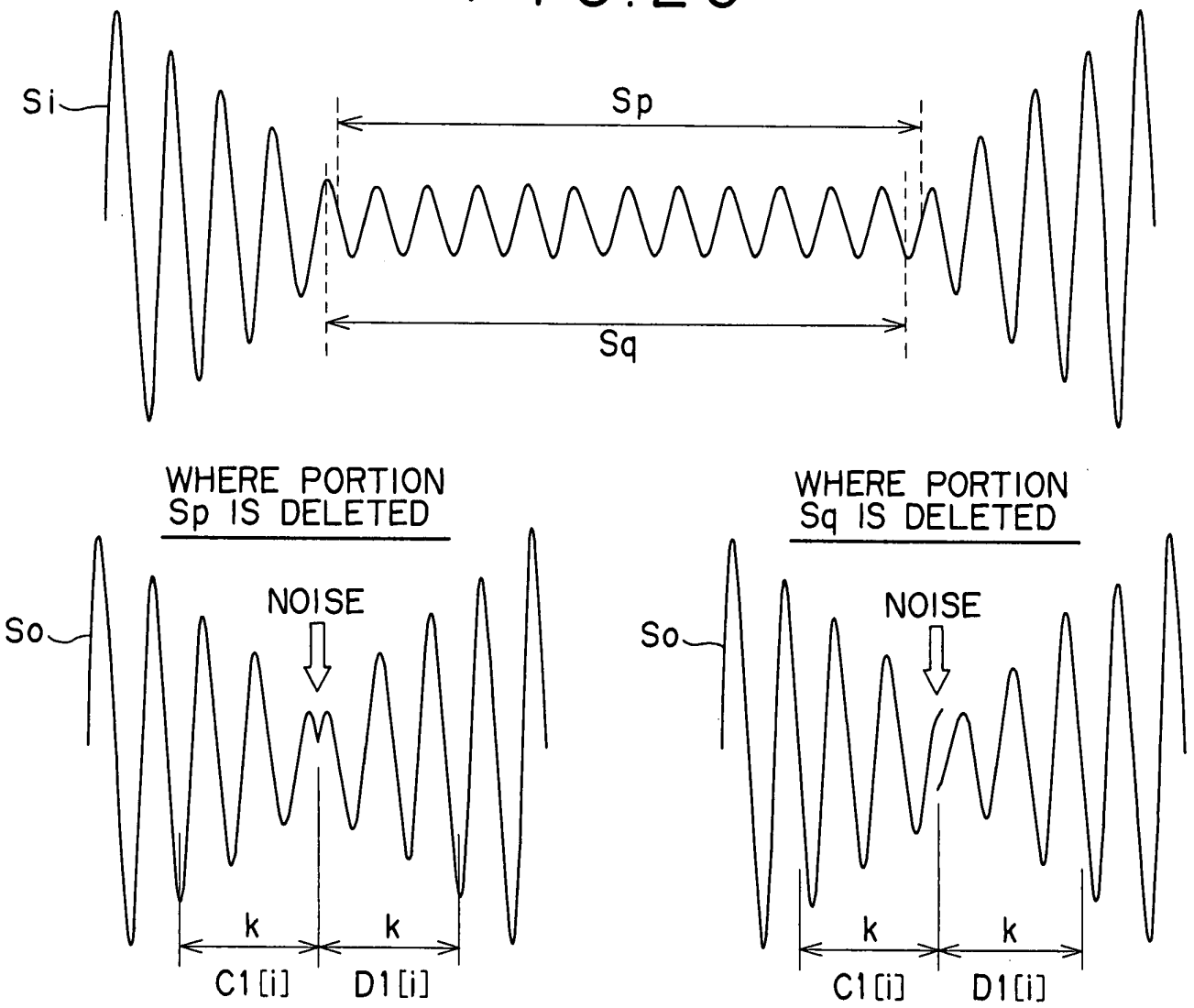
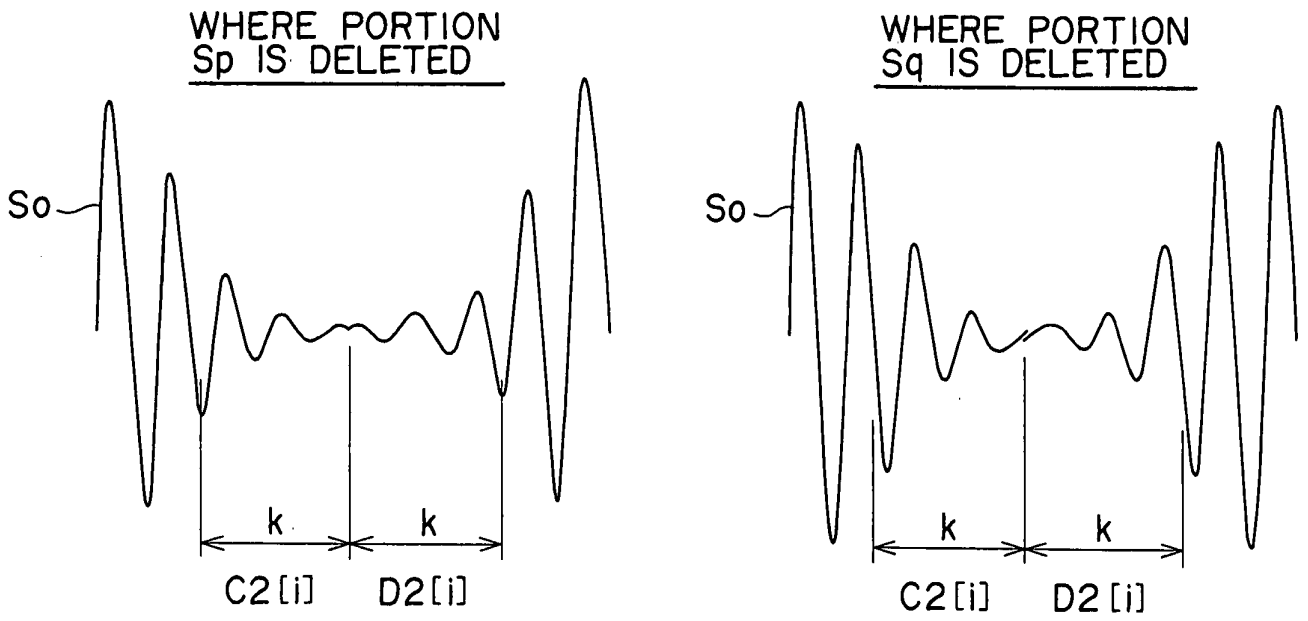
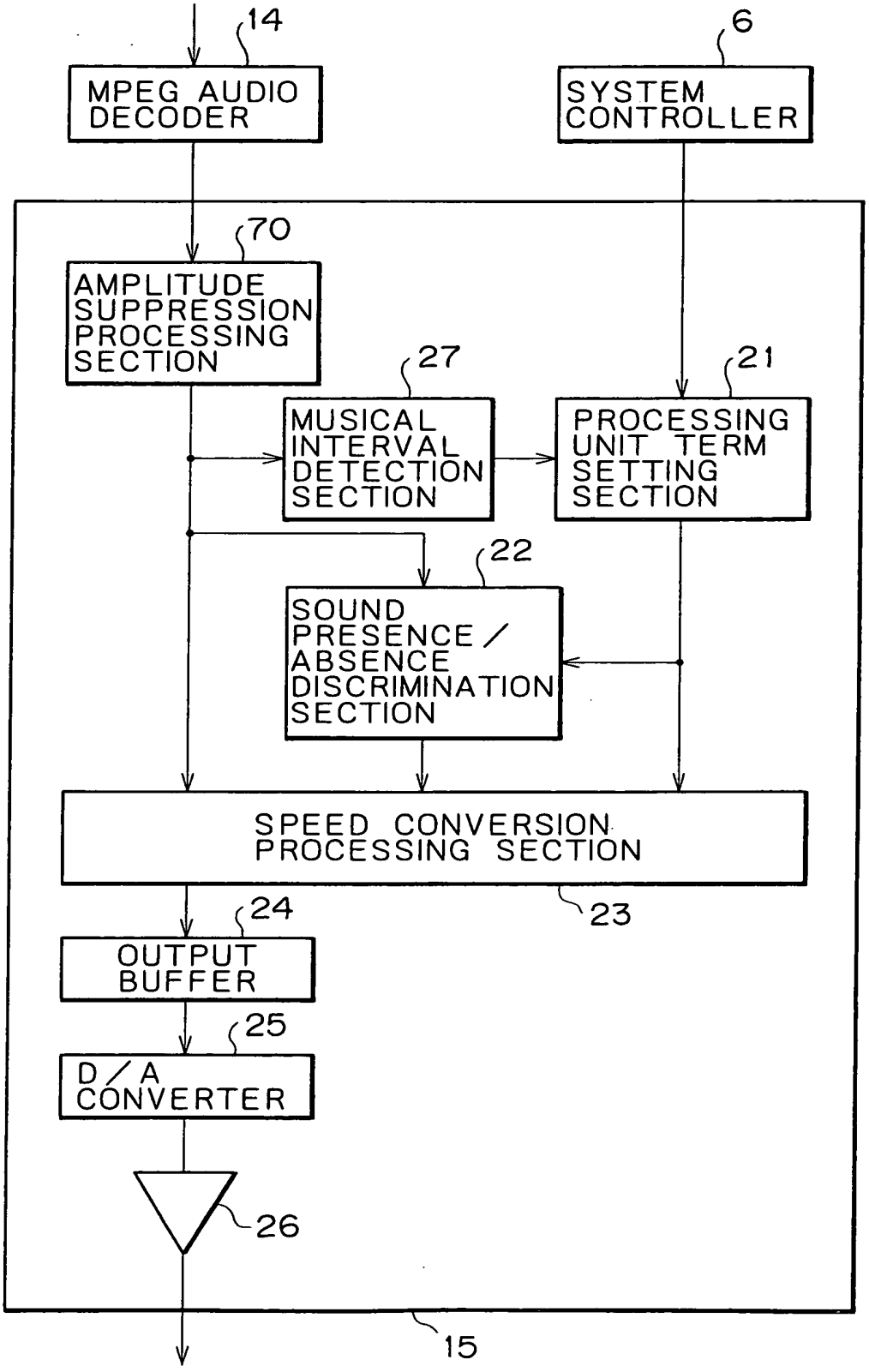

Si
Sp
Sq
WHERE PORTION
Sp IS DELETED
So
NOISE
k
k
C1[i]
D1[i]
WHERE PORTION
Sq IS DELETED
So
NOISE
k
k
C1[i]
D1[i]

FIG. 21



$$C2[i] = (k-i) * C1[i]/k \ , \ D2[i] = i * D1[i]/k$$

FIG. 22


14
MPEG AUDIO DECODER
6
SYSTEM CONTROLLER
70
AMPLITUDE SUPPRESSION PROCESSING SECTION
27
MUSICAL INTERVAL DETECTION SECTION
21
PROCESSING UNIT TERM SETTING SECTION
22
SOUND PRESENCE / ABSENCE DISCRIMINATION SECTION
SPEED CONVERSION PROCESSING SECTION
23
24
OUTPUT BUFFER
25
D / A CONVERTER
26
15

0022360 0062360

FIG. 23

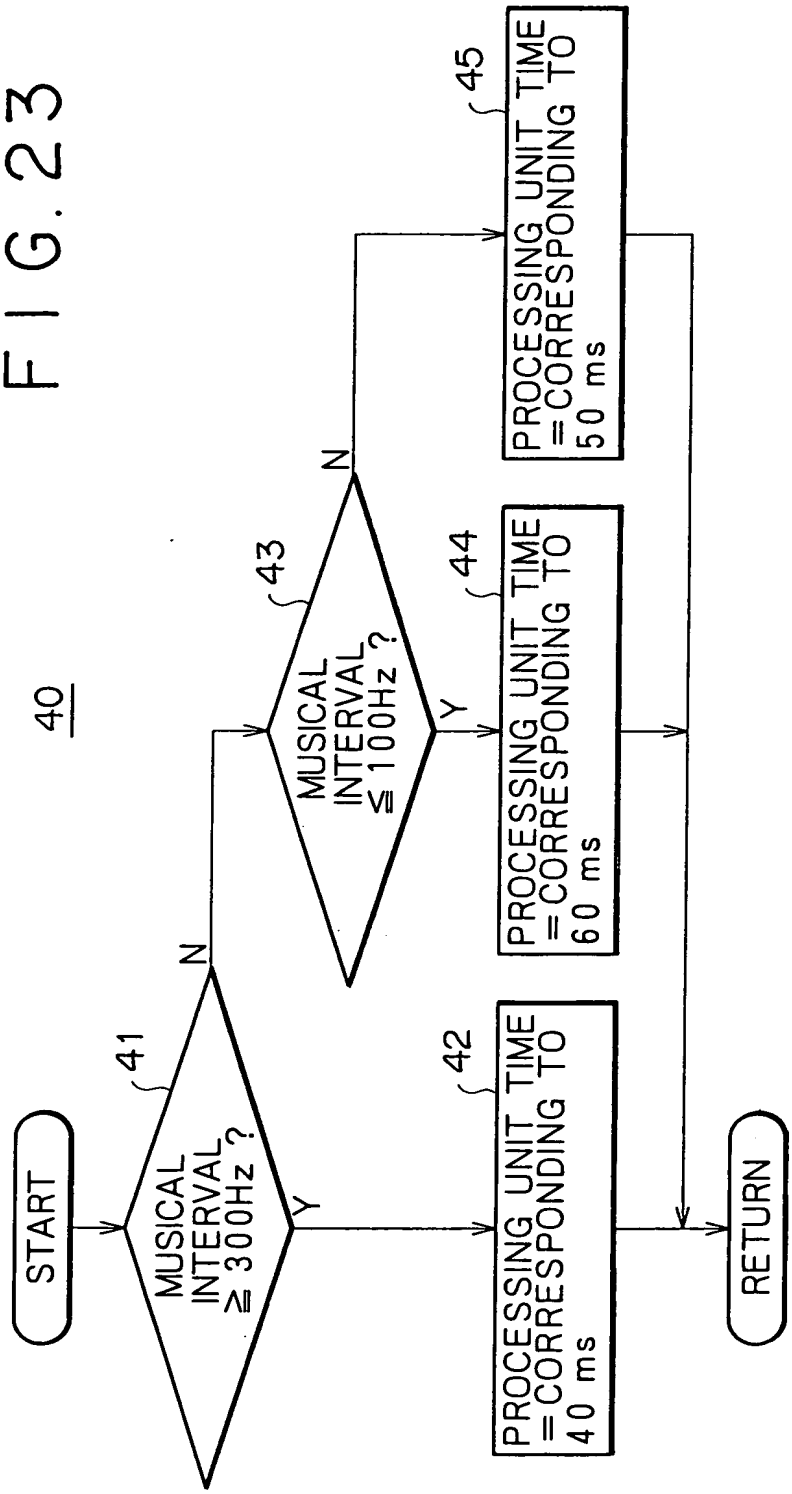
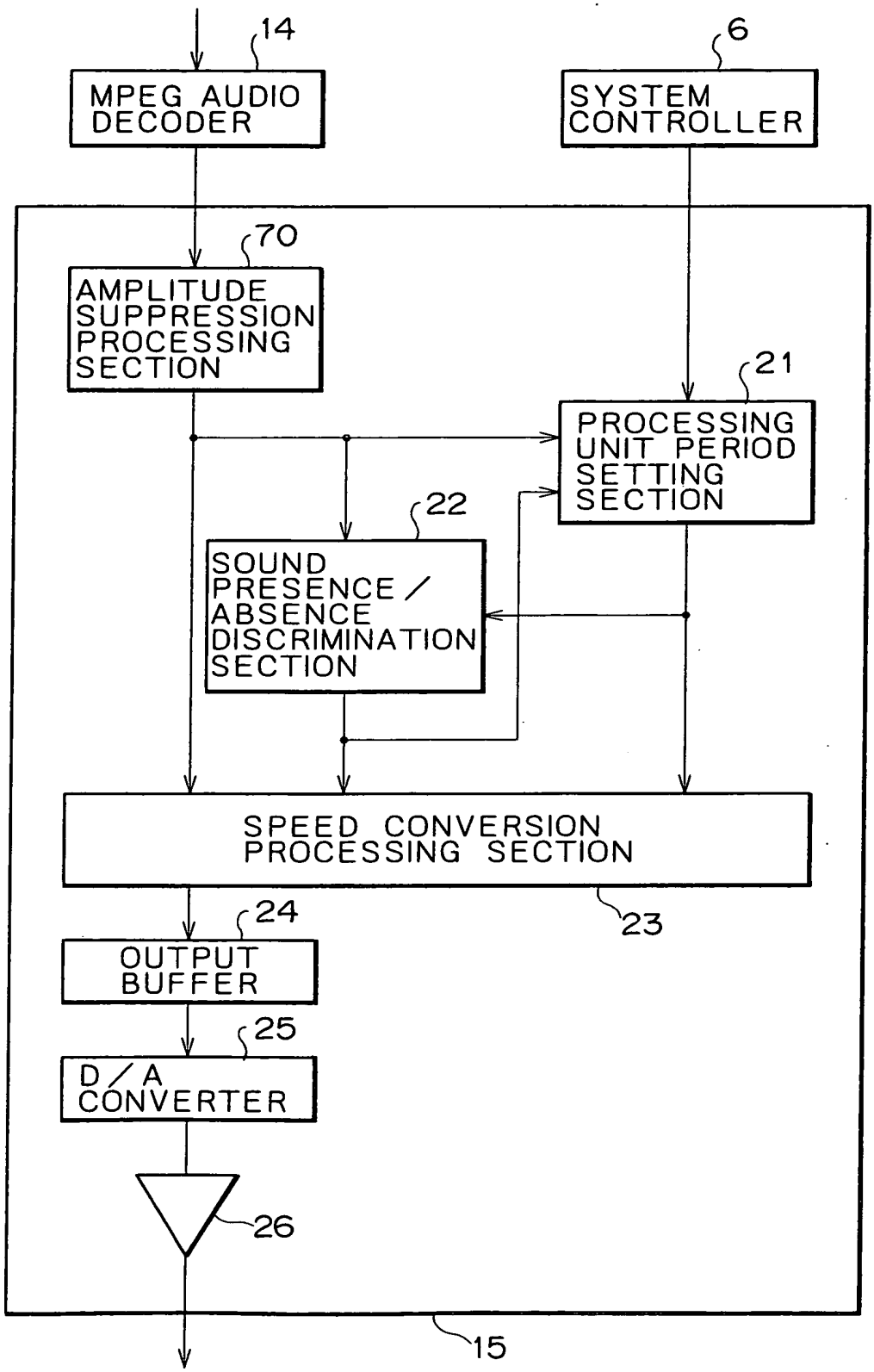


FIG. 24


14
MPEG AUDIO DECODER
6
SYSTEM CONTROLLER
70
AMPLITUDE SUPPRESSION PROCESSING SECTION
21
PROCESSING UNIT PERIOD SETTING SECTION
22
SOUND PRESENCE / ABSENCE DISCRIMINATION SECTION
SPEED CONVERSION PROCESSING SECTION
23
24
OUTPUT BUFFER
25
D / A CONVERTER
26
15

50

FIG. 25

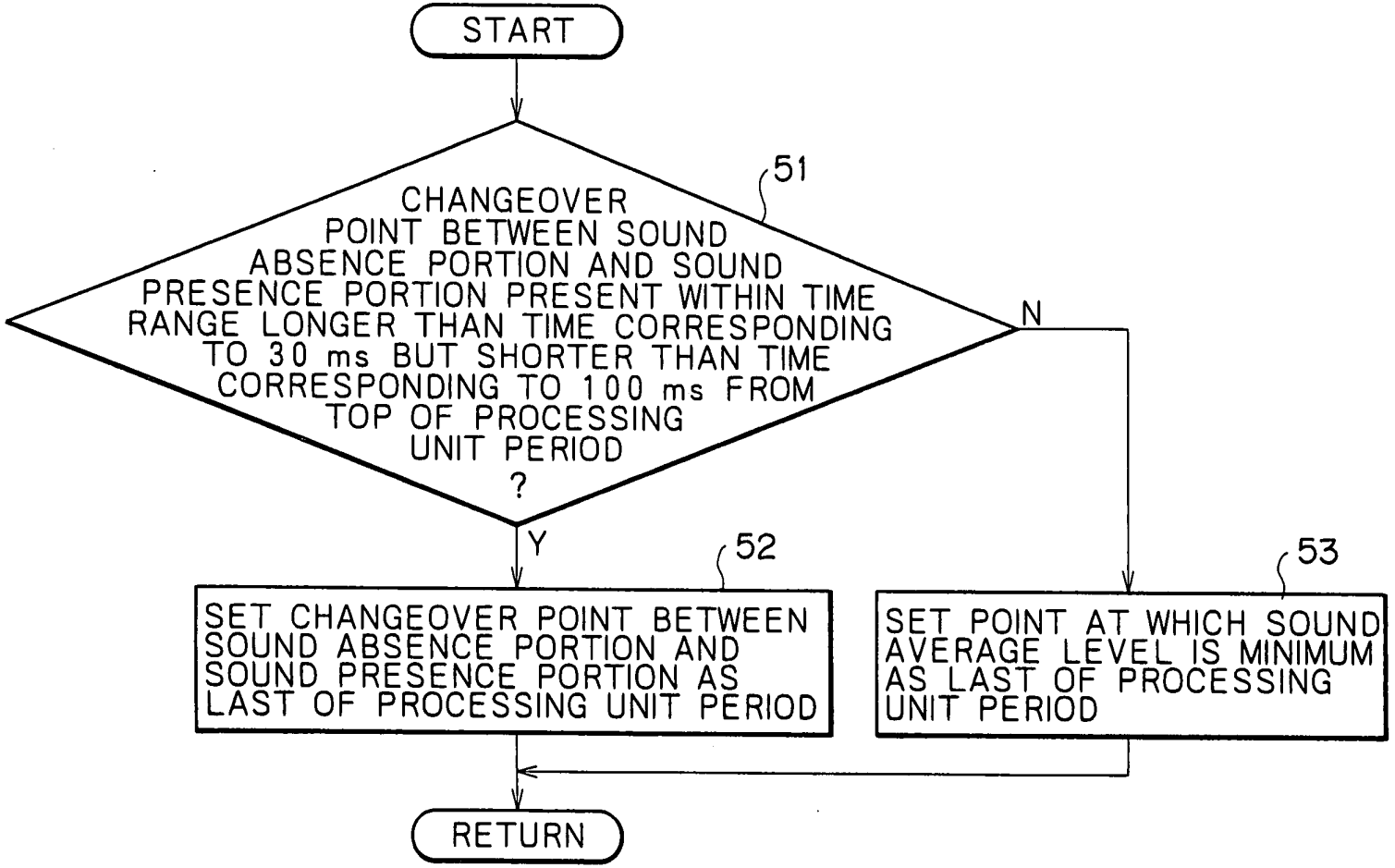

START
51
CHANGEOVER POINT BETWEEN SOUND ABSENCE PORTION AND SOUND PRESENCE PORTION PRESENT WITHIN TIME RANGE LONGER THAN TIME CORRESPONDING TO 30 ms BUT SHORTER THAN TIME CORRESPONDING TO 100 ms FROM TOP OF PROCESSING UNIT PERIOD ?
N
Y
52
SET CHANGEOVER POINT BETWEEN SOUND ABSENCE PORTION AND SOUND PRESENCE PORTION AS LAST OF PROCESSING UNIT PERIOD
53
SET POINT AT WHICH SOUND AVERAGE LEVEL IS MINIMUM AS LAST OF PROCESSING UNIT PERIOD
RETURN

FIG. 26

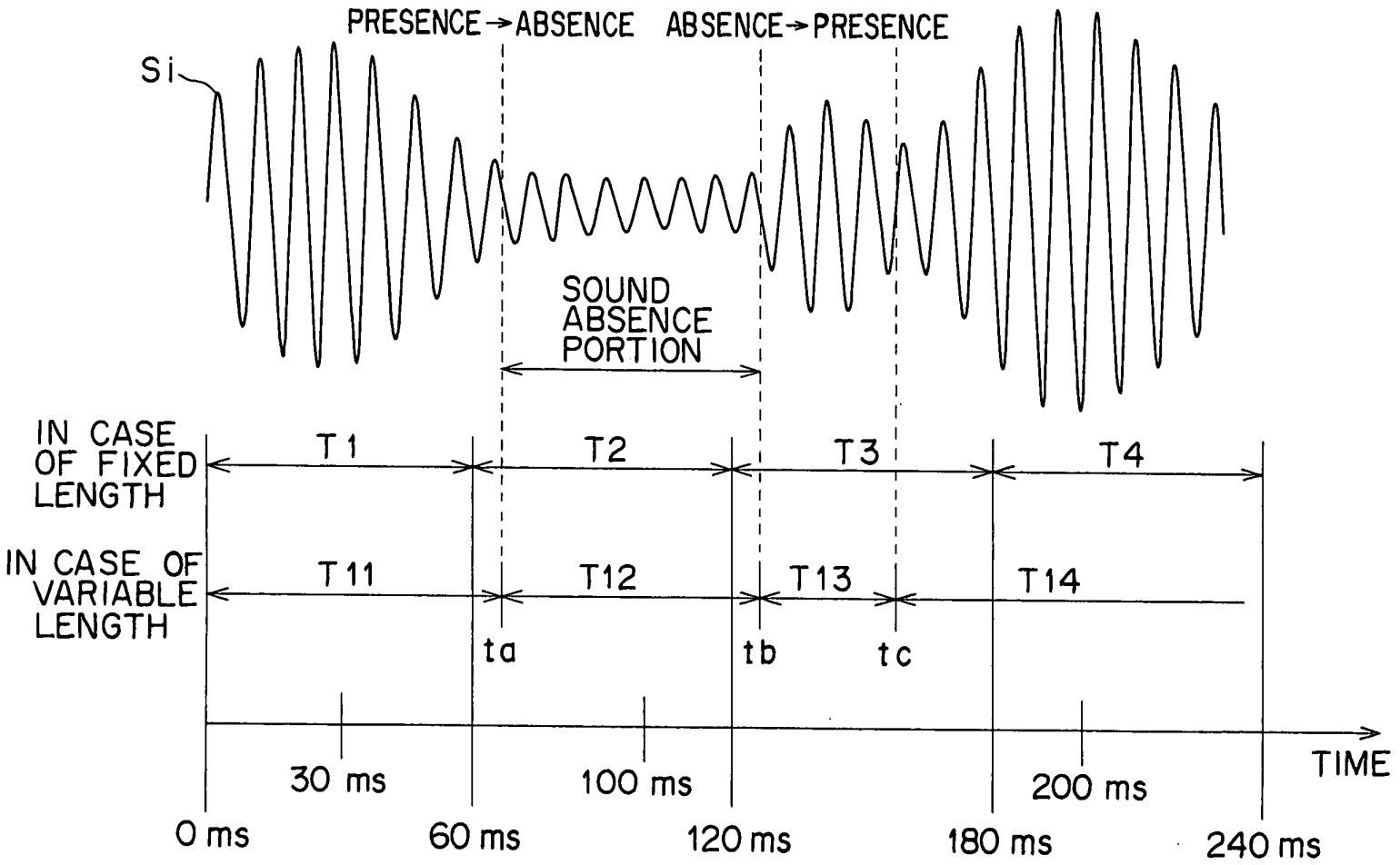

PRESENCE→ABSENCE
ABSENCE→PRESENCE
Si
SOUND ABSENCE PORTION
IN CASE OF FIXED LENGTH
T1
T2
T3
T4
IN CASE OF VARIABLE LENGTH
T11
T12
T13
T14
ta
tb
tc
30 ms
100 ms
200 ms
TIME
0 ms
60 ms
120 ms
180 ms
240 ms

FIG. 27

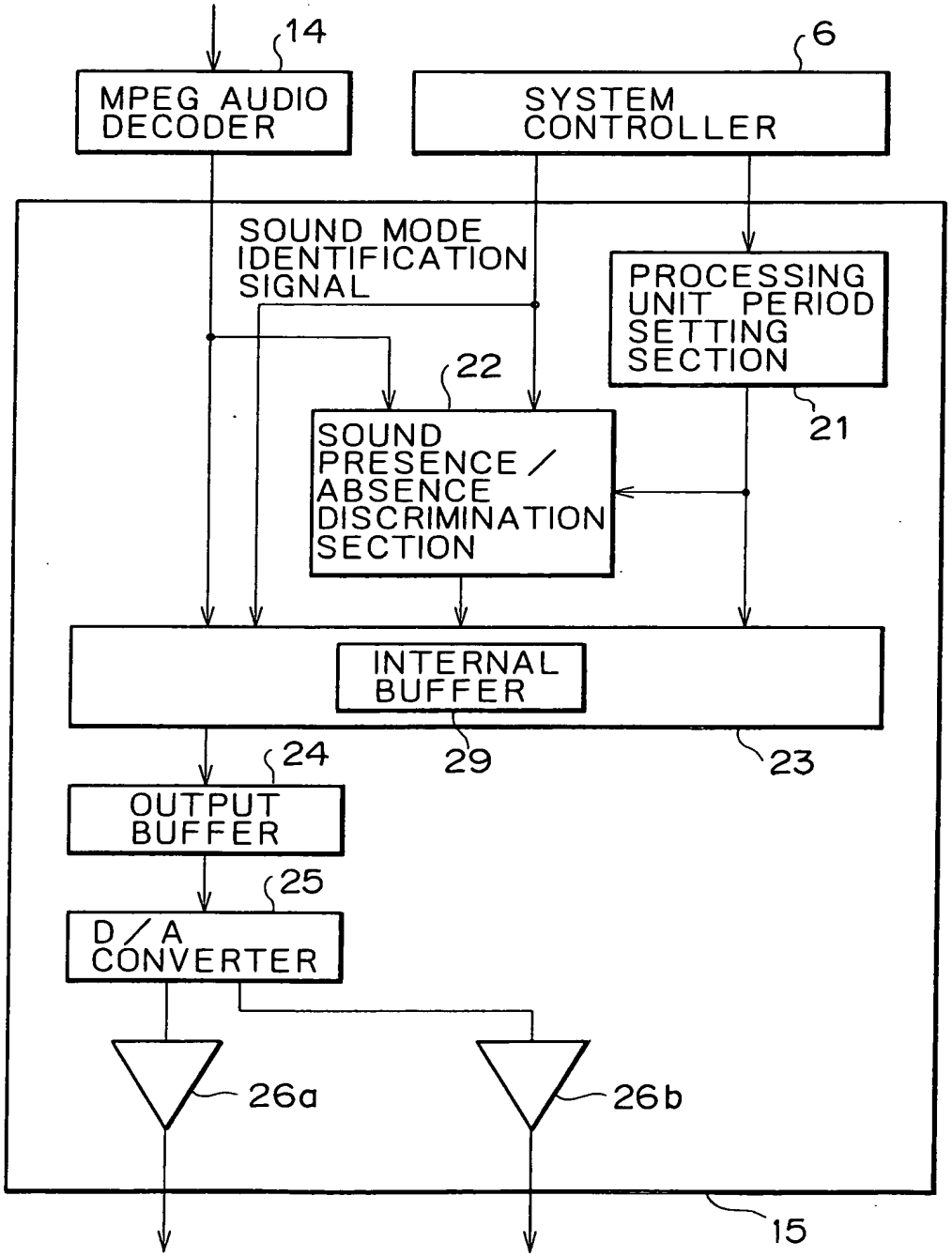

14
MPEG AUDIO DECODER
6
SYSTEM CONTROLLER
SOUND MODE IDENTIFICATION SIGNAL
PROCESSING UNIT PERIOD SETTING SECTION
21
22
SOUND PRESENCE / ABSENCE DISCRIMINATION SECTION
INTERNAL BUFFER
29
23
24
OUTPUT BUFFER
25
D / A CONVERTER
26a
26b
15

FIG.28

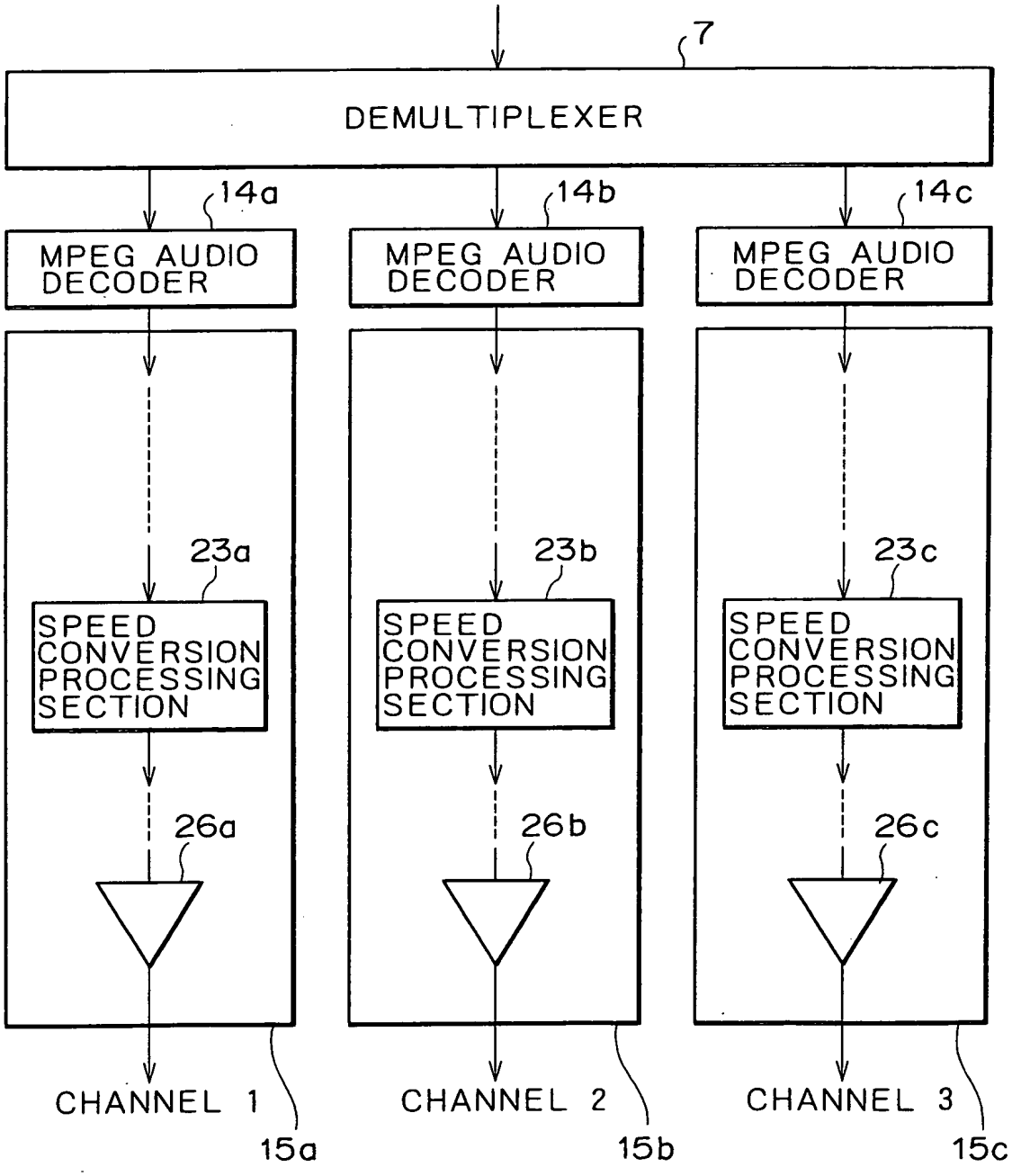
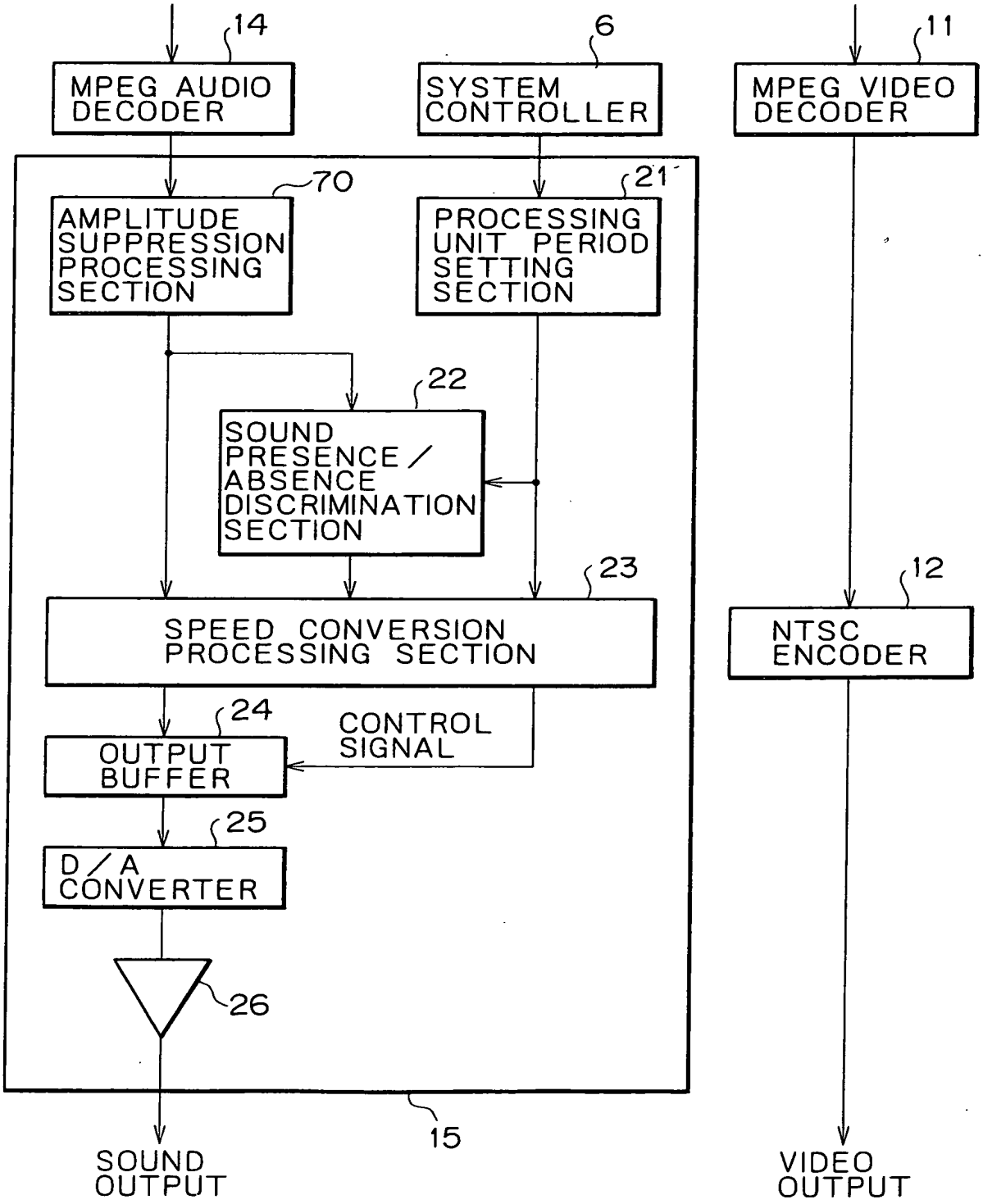

7
DEMULTIPLEXER
14a
14b
14c
MPEG AUDIO DECODER
MPEG AUDIO DECODER
MPEG AUDIO DECODER
23a
23b
23c
SPEED CONVERSION PROCESSING SECTION
SPEED CONVERSION PROCESSING SECTION
SPEED CONVERSION PROCESSING SECTION
26a
26b
26c
CHANNEL 1
CHANNEL 2
CHANNEL 3
15a
15b
15c

FIG.29


14
MPEG AUDIO DECODER
6
SYSTEM CONTROLLER
11
MPEG VIDEO DECODER
70
AMPLITUDE SUPPRESSION PROCESSING SECTION
21
PROCESSING UNIT PERIOD SETTING SECTION
22
SOUND PRESENCE / ABSENCE DISCRIMINATION SECTION
23
SPEED CONVERSION PROCESSING SECTION
12
NTSC ENCODER
24
OUTPUT BUFFER
CONTROL SIGNAL
25
D / A CONVERTER
26
15
SOUND OUTPUT
VIDEO OUTPUT